Introducing supramolecular polymers to DNA nanotechnology

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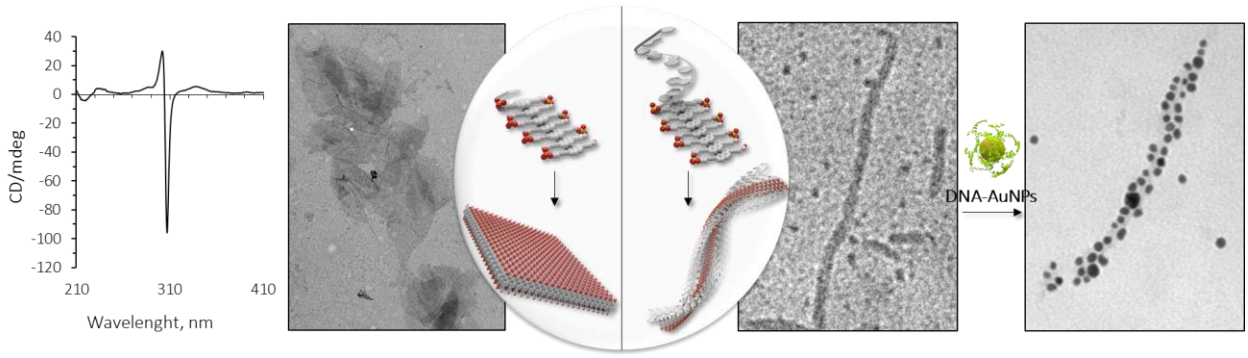
Self-assembly of DNA-containing molecules into biocompatible functional materials has attracted considerable attention over the last years. In this contribution, we present our recent findings in the field of self-assembled DNA conjugates and their potential applications as stimuli-responsive materials, cargo binding vehicles, and energy transfer platforms. The DNA conjugates consist of a short oligonucleotide strand covalently bound to an array of phosphodiester-linked pyrenes. Depending on the strand composition and conditions, the self-assembly governed by the stacking and hydrophobic interactions between pyrenes leads to a variety of shapes: micelles, one-dimensional ribbons and two-dimensional nanosheets. In the case of 1D structures (DNA-grafted supramolecular polymers), the polymer core is formed by the stacked pyrenes, whereas the oligonucleotides are arranged at the edges of the ribbons in a comb-like fashion. The abstract plus figure must not exceed one page. Page margins must not be changed.



References

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